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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/891,511	06/27/2001	Mamoru Nakasuji	010819	8779

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EXAMINER	
BERMAN, JACK I	

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 05/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/891,511	NAKASUJI ET AL.	
	Examiner	Art Unit	
	Jack I. Berman	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-60* is/are pending in the application.

4a) Of the above claim(s) *17-59* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16 and 60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 6-9, 11, 15, 16, and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,665,968 to Meisburger et al. in view of U.S. Patent No. 6,479,819 to Hamashima et al. As was explained in the previous Office action, Meisburger et al. discloses an inspecting apparatus for inspecting an object to be inspected by irradiating charged particles onto said object to be inspected, said apparatus comprising: a working chamber for inspecting said object to be inspected, said chamber capable of being controlled to have a vacuum atmosphere (see the section labeled VACUUM SYSTEM beginning at line 52 in column 19); a beam generating means for generating said charged articles as a beam (see lines 14-23 in column 9); an electronic optical system for guiding and irradiating said beam onto said object to be inspected held in said working chamber, detecting secondary charged particles emanated from said object to be inspected and introducing said secondary charged particles to an image processing system (see lines 23-64 in column 9); said image processing system for forming an image by said secondary charged particles (see sections labeled VIDEO FRAME BUFFER and IMAGE DISPLAY in column 18); an information processing system for displaying and/or storing status information of said object to be inspected based on output from said image processing system (see the sections labeled DEFECT PROCESSOR in column 14 and POST PROCESSOR in column 18); a stage unit (24) for operatively holding said object to be inspected so as to be movable with respect to said beam; a carrying mechanism for securely

accommodating said object to be inspected and for transferring said object to or from said working chamber (see sections labeled SUBSTRATE HANDLER in column 19 and LOAD OPERATION starting in column 20); an alignment controller for observing the surface of said object to be inspected for the alignment of said object to be inspected with respect to said electron-optical system to control the alignment (see section labeled ALIGNMENT COMPUTER in column 16) wherein the alignment of said object to be inspected includes rough alignment performed within said mini-environment space (see lines 7-25 in column 19) and alignment in XY-directions and alignment in a rotating direction performed on said stage device (see lines 26-37 in column 19 wherein the alignment in a rotating direction is performed by rotating the beam scan); and a laser interferometry range finder for detecting coordinates of said object to be inspected on said stage device, said coordinates of said object to be inspected being determined by said alignment controller using patterns formed on said object to be inspected (see section labeled INTERFEROMETERS in column 17); an E x B separator (Wien filter deflectors 112 and 113), having an electric field and a magnetic field crossing at right angles, into which said charged particles and said secondary charged particles enter, said secondary charged particles being advanced in a direction approximately opposite to said charged particles, and in which said charged particles or said secondary charged particles are deflected selectively, said E x B separator characterized in that: the electrodes (112) for generating an electric field are made up of three or more pairs of non-magnetic conductive electrodes, and are arranged so as to approximately form a cylinder (see lines 31-45 in column 11); an electrode (107) for controlling the electric field intensity in a plane of said sample to be inspected, and thereby uniforming a distribution or reducing the potential level of electric charge residing on said object, said plane

being exposed to said electron beam irradiation, said electrode being arranged between said objective lens and said sample to be inspected and having a shape approximately symmetrical with respect to the optical axis of irradiation of said beam (see lines 54 in column 12 through line 4 in column 13); an image obtaining means for obtaining respective images for a plurality of regions to be inspected, said regions being displaced from one another while being partially superimposed one on another on said sample; a storage means for storing a reference image; and a defect determination means for determining any defects in said sample by comparing said respective images obtained by said image obtaining means for said plurality of regions to be inspected with said reference images stored in said storage means (see section labeled DEFECT PROCESSOR beginning in column 14). Meisburger et al. also teaches to use this apparatus to inspect an object to detect defects on a wafer "in a production environment" i.e. in the middle of a process or subsequent to the process (see line 49 in column 3 through line 13 in column 4). In the amendment filed on February 3, 2004, Applicant attempted to distinguish over Meisburger et al. by adding the limitation that the beam irradiated onto the object to be inspected comprises either a multi-beam or an area-beam and the image processing system includes a CCD or a "TID" [*sic*] image sensor. Hamashima et al. teaches that that the sensitivity and speed of an electron beam wafer inspection system can be increased over the sensitivity and speed of a focused scanning beam system by irradiating the primary beam as an area beam (see lines 12-17 in column 5) and using a CCD camera (48) having a TDI array CCD sensor. It would have been obvious to a person having ordinary skill in the art to use the Hamashima et al. area beam and CCD image sensor in the Meisburger et al. system in order to achieve the greater speed and sensitivity taught by Hamashima et al.

Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meisburger et al. and Hameshima et al. as applied to claims 1, 2, 6-9, 11, 15, 16, and 60 above, and further in view of Davis et al. and Lo et al. as applied to claims 3 and 5 in the previous Office action.

Claims 4, 10, 12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meisburger et al. and Hameshima et al. as applied to claims 1, 2, 6-9, 11, 15, 16, and 60 above, and further in view of Lo et al. as applied to claims 4, 10, 12, and 14 in the previous Office action.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meisburger et al. and Hameshima et al. as applied to claims 1, 2, 6-9, 11, 15, 16, and 60 above, and further in view of Petric as applied to claim 13 in the previous Office action.

Applicant's arguments filed February 3, 2004 have been fully considered but they are not persuasive. Applicant argues that no reference discloses or suggests the features of a carrying mechanism that securely accommodates an object to be inspected, as claimed in claim 2, or a rough alignment performed within a mini-environment space and thereafter fine alignment in XY-direction and in a rotating direction performed on the stage device, as claimed in claim 7. However, as the examiner explained in the previous Office action and repeated above:

> "Meisburger et al. discloses an inspecting apparatus for inspecting an object to be inspected by irradiating charged particles onto said object to be inspected, said apparatus comprising: ... a carrying mechanism for securely accommodating said object to be inspected and for transferring said object to or from said working chamber (see sections labeled SUBSTRATE HANDLER in column 19 and LOAD OPERATION starting in column 20); an alignment controller for observing the surface of said object to be inspected for the alignment of said object to be inspected with respect to said electron-optical system to control the alignment (see section labeled ALIGNMENT COMPUTER in column 16) wherein the alignment of said object to be inspected includes rough

> alignment performed within said mini-environment space (see lines 7-25 in column 19) and alignment in XY-directions and alignment in a rotating direction performed on said stage device (see lines 26-37 in column 19 wherein the alignment in a rotating direction is performed by rotating the beam scan)..."

Therefore, applicant's assertions that these features are not disclosed are incorrect.

With regards to claim 3, Applicant argues:

> "Claim 3 defines that a working chamber and a loading chamber are supported through a vibration isolator. Lo, *et al.* teaches that a vacuum chamber is mounted on an active vibration isolation platform, not providing a vibration isolator between the working chamber and the loading chamber."

However, this argument mischaracterizes the invention disclosed in the application. Claim 3 claims:

> "An inspection apparatus according to claim 2, ... wherein said working chamber and said loading chamber are supported through a vibration isolator."

Applicant's argument interprets the phrase "through a vibration isolator" in claim 3 as requiring a vibration isolator between the working chamber and the loading chamber. As can be seen from the discussion on pages 72 through 73 of the specification along with Figures 1 and 2 of the drawings, the working chamber 31 and the loading chambers 41 and 42 are supported *through*, i.e. *by means of*, a vibration isolator 37. It is clear from this disclosure that the word "through" is used only in this sense of "by means of" so that the working chamber and loading chambers are mounted on the vibration isolator in the same way as the Lo et al. apparatus. There is no disclosure of the vibration isolator between the working chamber and the loading chamber. In fact, such an arrangement would not fulfill the function stated on page 72 of blocking vibrations from the floor on which the base frame 36 is installed from being transmitted to the rigid structure. This argument is therefore also unpersuasive.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack I. Berman whose telephone number is (571) 272-2468. The examiner can normally be reached on M-F (8:30-6:00) with every second Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571) 272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jack I. Berman
Primary Examiner
Art Unit 2881

jb
5/10/04